

UNITED STATES DEPARTMENT OF AGRICULTURE
RURAL ELECTRIFICATION ADMINISTRATION
WASHINGTON 25, D. C.

December 12, 1951

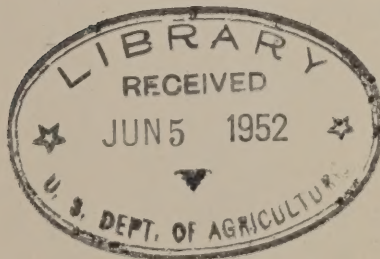
To All Electrification Borrowers:

Enclosed for your information is a copy of a statement entitled "Rural Electrification -- A Vital Defense Resource," which was recently prepared for use in informing defense officials about the REA program.

Claude R. Wickard

Administrator

Enclosure



THE UNIVERSITY OF CHICAGO

THE DIVISION OF THE PHYSICAL SCIENCES

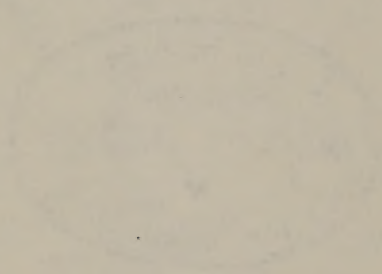
PHYSICS DEPARTMENT

February 12, 1941

TO THE PRESIDENT OF THE UNIVERSITY

Enclosed for your information is a copy of a letter
from the Division of the Physical Sciences dated
January 22, 1941, and a copy of a letter from
the Division of the Physical Sciences dated January 22, 1941,
concerning the proposed visit of Dr. J. R. Oppenheimer.

Very respectfully,
Charles F. Johnson



RURAL ELECTRIFICATION,



A VITAL DEFENSE RESOURCE

U. S. DEPARTMENT OF AGRICULTURE

U. S. RURAL ELECTRIFICATION ADMINISTRATION

Nov. 19, 1951



There has been a tendency to classify electric service for the farmer as a luxury, to confuse the Federal rural

electrification program with the large public works programs of the Government and to insist that it be curtailed or delayed. Some have said that materials should not be provided for rural electrification, arguing that farmers who have done without electricity throughout the years should be able to do without it a while longer.

These views are voiced by persons who do not appear to question the allocation of controlled materials for use in providing urban electric service. Yet the fact is that electric service — far from being a luxury — is even more vital for farmers than for urban people. For the city family, electricity means comfort and convenience. For the farm family, it means that and much more. It means production power.

RURAL ELECTRIFICATION A VITAL DEFENSE RESOURCE

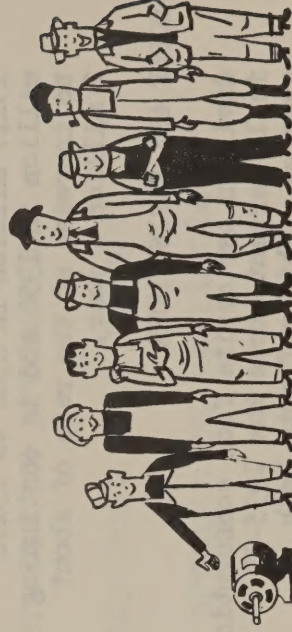
Electricity is universally recognized as one of America's basic resources — essential to the functioning of the National economy.

The special relationship of electricity to agriculture and to maximum farm production is not so well recognized, and questions are sometimes raised, in these days of critical material shortages, about the contribution of rural electrification to National mobilization.

The farm is both a home and a business. Electricity, like soil and water, is a resource which farmers use as a production tool. Farmers cannot make their maximum contribution to the mobilization effort without adequate supplies of electric power along with the many other tools they must have. If denied this service, they are unable to realize the efficiencies in their business operations that are considered essential for every other type of business enterprise.

The development of electrified farming has been so rapid and so unobtrusive that many people have little idea of the productive force that electricity injects into American agriculture at this time when unprecedented demands are being made on the Nation's farmers.

The purpose of the statement that follows is to give a better picture of this situation as a basis for determining the extent to which controlled materials should be made available for rural electrification.



A 1 H.P. MOTOR WILL DO AS MUCH WORK AS 8 MEN

FARMERS FACE CRITICAL AGRICULTURAL PRODUCTION JOB

Farmers are being called upon today to carry out a greater production job than any they have ever faced. Here are some of the reasons why this is essential:

MILITARY DEMANDS ARE GREAT

It takes more food to feed men in the armed forces than the same number of civilians.

OUR POPULATION IS INCREASING

The U. S. population rose from 131.7 million in 1940 to 151.8 million in 1950 and is continuing to increase at the rate of about 2 million a year.

PEOPLE ARE EATING MORE

Civilian per capita food consumption is 13 percent above the 1935-39 average. This reflects both

expanded consumer purchasing power and a better-fed Nation.

EXPORT DEMAND IS HIGH

The volume of agricultural exports is 50 percent higher than the 1935-39 average. Demand exists for even greater amounts, but limited supplies have made it necessary to restrict some exports.

PRODUCTION CURBS INFLATION

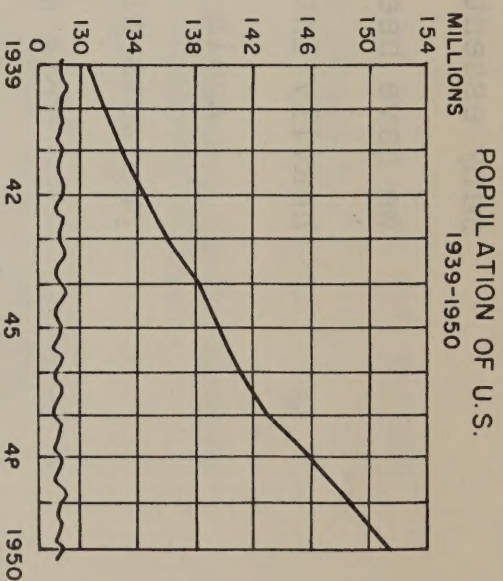
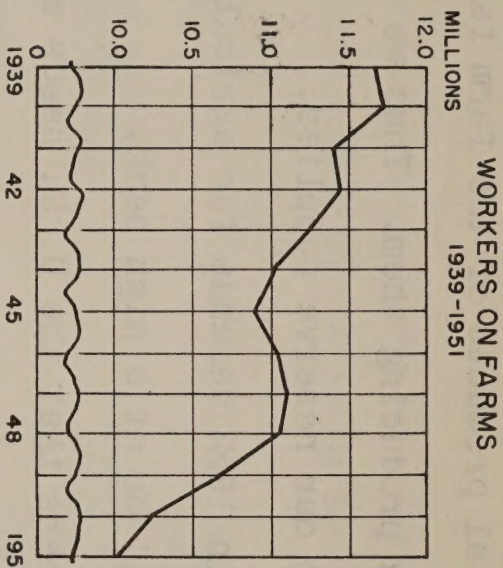
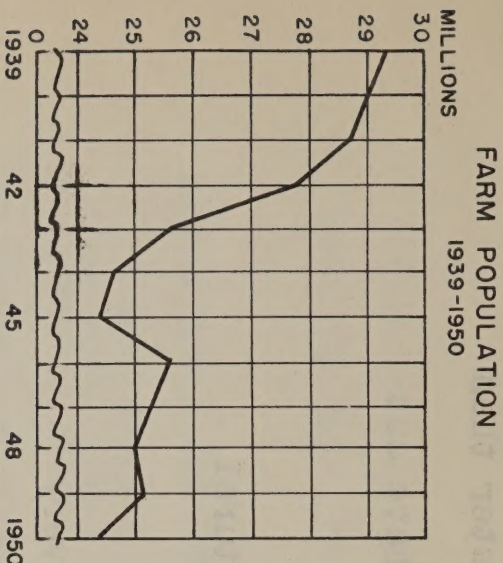
The increasing demand for food naturally acts to advance food prices unless supplies also increase. High level production is the greatest contribution our food plant can make to price stability.

Ever since Korea, we have been consuming many essential products of the farm faster than we have been producing them. Thus we have cut heavily into our reserve supplies.

Again in 1952 demands for agricultural products will be at a high peak.

This means that the U. S. needs every ounce of farm output that can be achieved, either through a direct increase in production or through greater efficiency that will reduce waste and make more of the production available for use.

FARM EMPLOYMENT DROPPED 351,000 IN PAST YEAR; IS 1,380,000 UNDER 1945-49 AVERAGE



Farm Employment in the United States

	September Average 1945-49	September 1950	September 1951
Family Labor	10,823,000	9,851,000	9,731,000
Hired Labor	3,909,000	3,852,000	3,621,000
Total	14,732,000	13,703,000	3,352,000

— Source, Bureau of Agricultural Economics

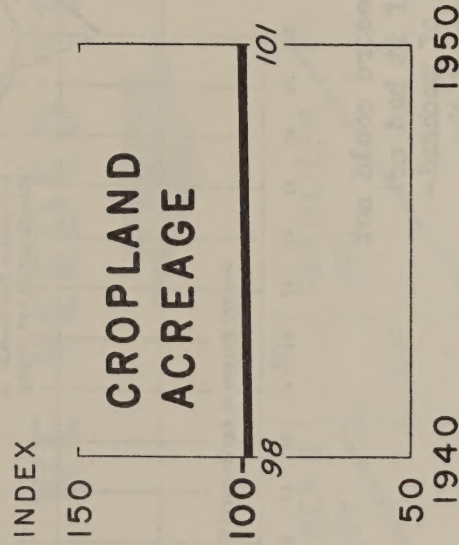
HOW CAN REQUIREMENTS BE MET?

With demand for farm products at an all-time high, farmers must contend with the following adverse factors:

No increase in acreage

There has been no significant increase in cropland acreage since 1940.

And none is in prospect for the immediate future.



1935-39=100

Manpower becoming more of a farm problem

The shortage of farm labor is more acute today than ever before. Farm population dropped by nearly 7,000,000, or 23 percent, from 1940 to 1950.

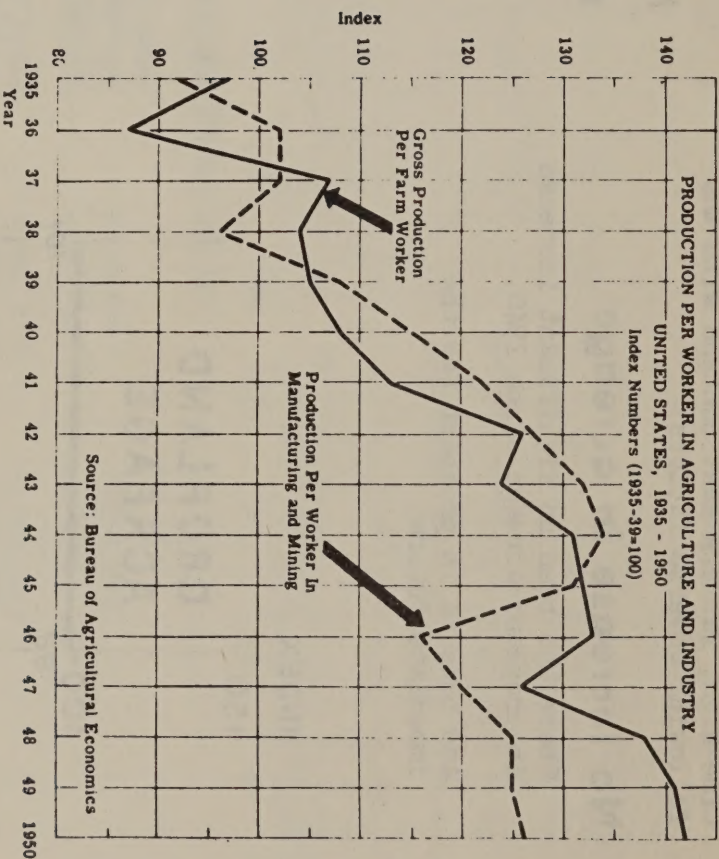
During the 12 months from September 1950 to September 1951, the farm labor force decreased more than 350,000. And the September 1951 farm employment was 1,380,000 under the 1945-49 September average.

Further reduction in farm manpower is likely in the face of attractive industrial job opportunities and rising wage rates.

This means that farmers are being asked to produce 42 percent more per agricultural worker than was produced just 10 years ago.

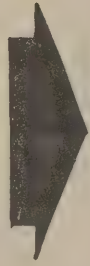
MODERN METHODS HAVE INCREASED OUTPUT

In the past 10 years, gross production per agricultural worker has increased about 30 percent. During the same period, gross production per worker in the manufacturing and mining industries has increased only a little more than 10 percent.



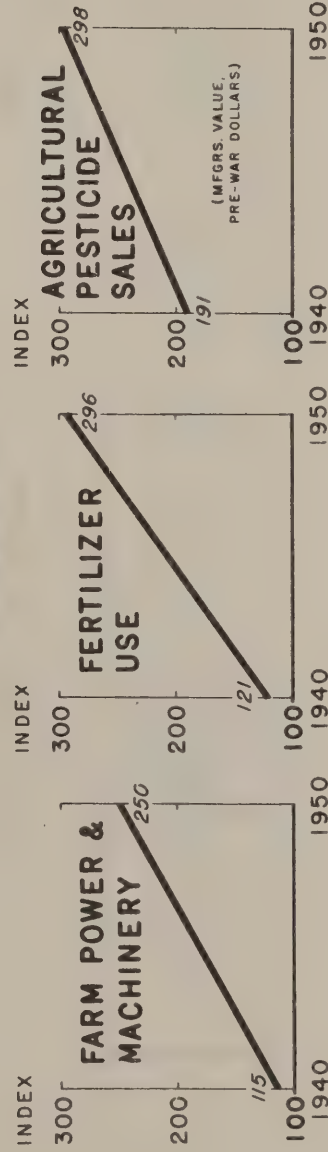
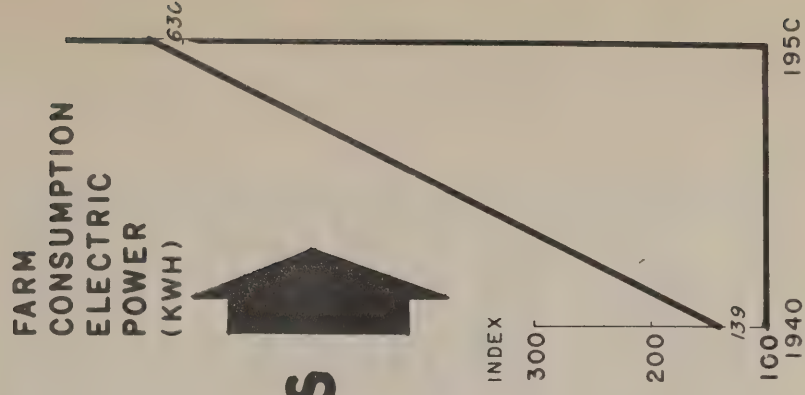
This farm productivity record could not have been accomplished if it had not been for the high degree of mechanization and electrification of the Nation's farms.

TO GET THIS



**FARM OUTPUT IN RELATION
TO PRODUCTION FACTORS**

WE NEEDED THESE PLUS THIS



ALL CHARTS:
1935-39=100

U.S. DEPARTMENT OF AGRICULTURE

ELECTRIC POWER NOW ON 84% OF FARMS

Approximately $4\frac{1}{2}$ million, or 84 percent, of the Nation's farms now have electric service. The number of electrified farms has considerably more than doubled since 1940.

Just as the tractor has revolutionized field work on the farm, the electric motor is revolutionizing work around the farmstead. The tremendous potential significance of that fact is generally overlooked by people who fail to realize that on the average farm about a third of the working time of the labor force is spent in doing farmstead chores. The increased use of electricity around the farmstead has given the farmer more opportunity and time to use modern machines and methods in the production of field crops.

A one-horsepower motor can do as much farmstead work in an hour as one man

can do by hand in an entire day.

One kilowatt-hour of electricity, costing 3 to 5 cents, can:

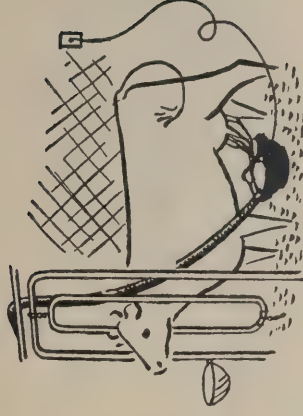
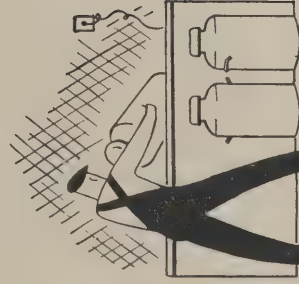
- Pump 500 or more gallons of water from a farm well.
- Milk 20 cows.
- Heat 4 gallons of water.
- Grind 100 pounds of grain.
- Run a tool grinder for 3 hours.
- Shell 30 bushels of corn.
- Cool 10 gallons of milk or
- Cut one ton of silage and elevate it into a 30-foot silo.

Most electric farm equipment requires no muscle power for its operation. It can be operated by old people, women and teen-age youngsters. That is why electricity holds such a tremendous potential for increasing farm output despite a reduced labor force.

Electricity essential in dairying

Dairying is perhaps the most important of all farm enterprises. The dairy cow is the most efficient converter of roughages and other feeds into human food, and dairy products are of first importance nutritionally.

Milk production is not keeping pace with the long term rising demand. The inability of farmers to obtain enough labor is a big part of the problem. Part of the answer has to be more improvement in our milk production efficiency. In recent years, milk production per man-hour has increased considerably more than milk production per cow. This is due almost



entirely to the use of such electrically operated equipment as:

ELECTRIC MILKING MACHINES

With two units of an electric milker, a man (or woman or boy or girl) can milk an average herd of 10 cows in one-third the time it takes by hand. The increase in use of electric milkers on farms closely parallels the increase in production per man-hour on dairy farms.

ELECTRIC WATER SYSTEM

An electric water system used to give cows plenty of water results in more and richer milk. For example, a study by the Iowa Experiment Station reports that

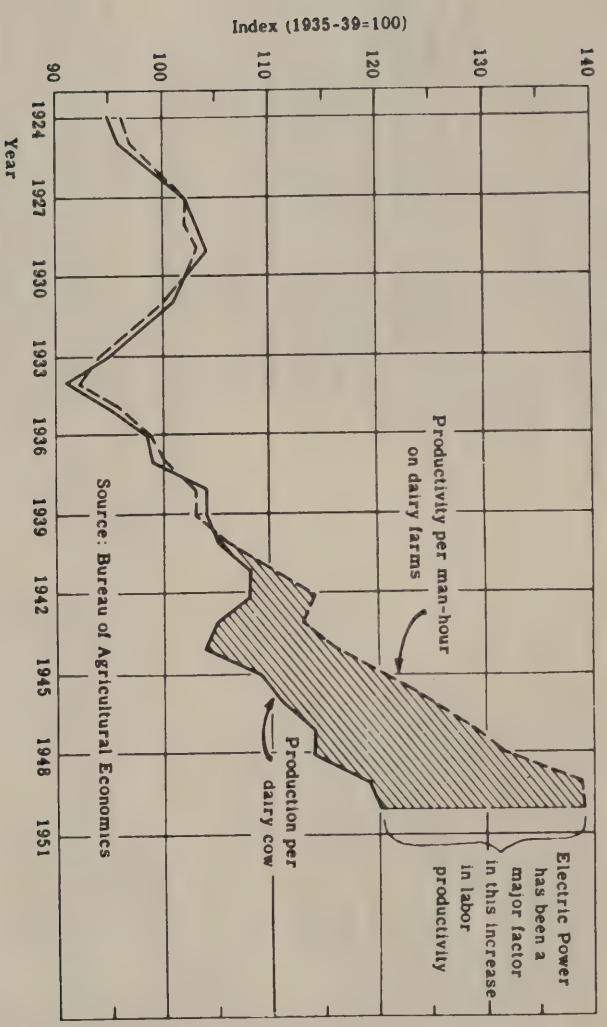
cows provided with water bowls yielded 3.5 percent more milk and 10.7 percent more butterfat than cows watered twice a day at an outside tank.

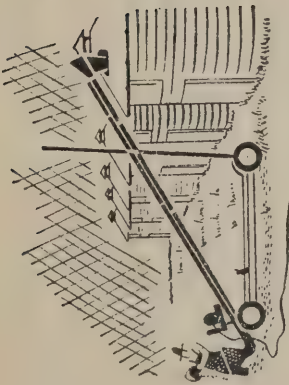
ELECTRIC COOLING AND STERILIZING EQUIPMENT

Electric coolers and water heaters

keep milk sweet and retard the growth of bacteria. This prevents waste and makes more milk of a higher quality available for market over a wider area. By using electrical milk coolers and water heaters, the farmers in the Ozark Mountains 200 miles from St. Louis are now producing Grade A milk for that market.

COMPARISON OF PRODUCTION PER MAN-HOUR AND PRODUCTIVITY PER COW, INDICATING THE INCREASE IN LABOR PRODUCTIVITY RESULTING PRIMARILY FROM USE OF ELECTRIC POWER





Electricity aids livestock and poultry production

On the typical livestock farm, it is estimated that the farmer's time is divided about equally between producing feeds and converting them through livestock and poultry into human food. Electrical equipment not only permits the farmer to produce more and better products around the farmstead; it also releases him for more time to grow the raw products in the field.

Here are some of the productive uses of electricity on the typical livestock farm:

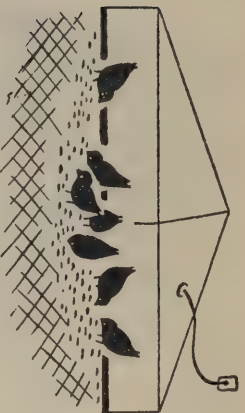
GRAIN CONDITIONING

High moisture content is one of the chief enemies of safe storage

of corn and other grains. The toll taken by mold alone on an average year's crop amounts to 150,000,000 bushels. Electric-powered grain dryers are now cutting these losses on many farms.

HAY DRYING

The electrically powered hay drier -- in the barn or in the field -- produces better, more nutritious hay. A group of New York farmers, for example, have records to prove that their cows produce more milk when they are fed mow-cured hay.



FEED HANDLING

A feed conveyor, powered by a motor, saves a farmer many hours of back-breaking work each year.

ELECTRIC WATER SYSTEM

An electric water system providing adequate water has been found to



result in heavier weight of livestock. For example, an Idaho Experiment Station study reveals that water supplied in quantity at temperatures stock would drink, resulted in an average of 8 pounds more gain per head for steers.

ELECTRIC BROODERS

Electric brooders are used for pigs, lambs and chicks. Tests have shown that farmers can cut down pig losses at weaning time about 30 percent by the use of an inexpensive electric brooder.

FEED MIXING

Mixing feed electrically takes one-third the time of hand mixing.

POULTRY HOUSE LIGHTING

Electric lights in the poultry house increase egg production as much as 10 percent during the fall and winter. A Pennsylvania farmer doubled his production by using electric lights, the electric egg grader and the electric pump to provide a constant supply of water.

Electricity has many other productive uses

Of the 400 known uses of electricity on the farm, at least 250 contribute directly to farm production.

MORE PRODUCTION WITH IRRIGATION

Electricity is the least expensive, most efficient source of power for large-scale pump irrigation installations in a large part of the West. Irrigation is the lifeblood of the arid sections of the country and has been largely responsible for such achievements as a doubled cotton production in Arizona in the last 10 years. The use of irrigation (principally sprinkler systems) is on the increase in the Eastern States. Records show that regular watering of farm and truck gardens in humid areas can increase yields of fruits and vegetables by as much as 50 percent.

FARM REPAIR SHOP REQUIRES POWER

An electrified farm shop, with a small motor and basic tools, saves the farmer money, delays and extra trips to town.

ELECTRIC HOTBEDS CUT LOSSES

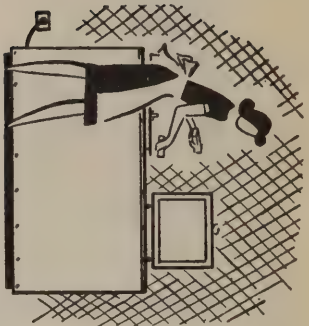
Electricity saves both time and money in starting fruit and vegetable plants. Careful experiments in



Texas with tomato plants and in Louisiana with sweet-potato plants show that growers can expect the use of electric cable to double the yield of seedlings.

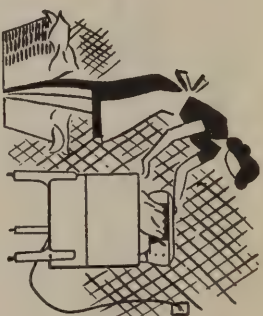
ON-THE-FARM PROCESSING YIELDS SAVINGS

Electricity is used extensively for on-the-farm curing of sweetpotatoes and tobacco and in the handling and processing of numerous fruit and vegetable crops. This reduces crop waste, saves labor and assures products that can be safely and efficiently stored, transported, processed and consumed.

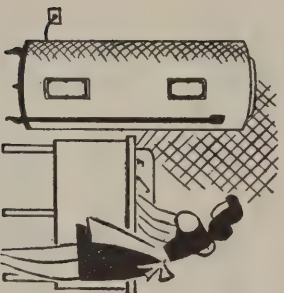


Electricity Productive Also in the Farm Household

From the standpoint of the farm household, electric service is distinctly more necessary than for urban residents. It would be most difficult to get an occupant for an urban home which did not have electricity available. It would be even more difficult if there were no running water, no modern cooking stove, no refrigeration and no method of doing laundry except a hand machine. Yet this is exactly the situation the farmer's wife is in when she does not have electricity.



Time saved for the farm homemaker by these electrical devices also contributes to production. The entire farm family is ordinarily part of the production team. The more quickly and efficiently the farm homemaker is able to care for her household work, the more assistance she is able to provide in caring for poultry and gardens and, in emergencies, with work around the barn and in the fields.



RURAL INDUSTRIES

In addition to farm uses, extensive use is made of electricity by industrial establishments in rural areas. Rural areas offer industries very definite inducements, such as labor supply, better choice of manufacturing neighbors, and availability of land for plant expansion and employee housing.

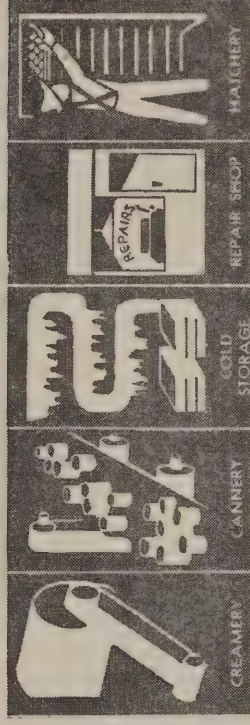
Reports from the 1,000 rural power systems financed by the Rural Electrification Administration indicate that at the end of 1950 these systems were serving approximately 7,000 industrial and large commercial installations, whose annual power consumption amounted to nearly 500,000,000 kwh.

Many of these rural industries are just as essential to the mobilization program as the industries located in the larger metropolitan centers. Repeatedly, rural power systems are being called upon to supply power to all types of factories, mines, assembly plants, defense installations and other power consumers that are directly a part of our mobilization effort.

A rural system in Illinois, for example, is building a transmission line that will enable it to serve the power needs of

REQUIRE POWER

fluorspar mines and mills in southern Illinois, an area that produces 75 percent of the Nation's supply of this type of ore. The ore is used to flux iron and aluminum and in the making of china, glass, enamels, refrigerants, fungicides, insecticides, plastics and hydrofluoric acid. It is also used in the process of



separating U-235 from the uranium metal.

A rural industry in Indiana produces a coolant filter extensively used in the manufacture of aircraft, machine tools and automobiles.

In North Carolina, a rural power system supplies power to mines producing 90 percent of the country's supply of the vital mineral, mica.

REA borrowers provide power to such

military establishments as Fort Leonard Wood in Missouri and the Patuxent Naval Air Station in Maryland, as well as numerous radar and radio range stations used for aircraft navigation.

Closely associated with these direct defense loads are the demands made on the agricultural producers of an area where a defense plant or military establishment is located. When people move into an area to man such an establishment,

heavy demands are made on the surrounding farm area for dairy and poultry products and other farm products that must be obtained locally. This situation results in urgent need by farmers for increased amounts of electrical equipment and power. Such demands are already being felt by some rural power systems, such as those in the vicinity of the South Carolina atomic energy plant.

THE RURAL COMMUNITY



MATERIAL NEEDS OF RURAL ELECTRIFICATION

The electric systems serving farm areas are confronted with two basic jobs:

★ One is to get service to as many as possible of the Nation's approximately 800,00 unelectrified farms so that they, too, may carry their share fully in the farm mobilization effort.

★ The other -- and possibly even more pressing -- part of the farm electrification job is to provide the 4½ million farms now electrified with service that farmers can depend upon for production jobs.

Because farmers are turning to electricity as a production tool on a rapidly increasing scale, there has been a dramatic rise in the amount of electric power consumed on farms in the last few years.

The amount of electric power consumed by all farmers has increased five-fold since 1940.

The experience of REA borrowers, which serve more than half the electrified farms, is even more significant. They

distributed twice as much power in fiscal 1951 as in 1948, and 3 times as much as in 1947.

As a result of these spectacular increases, rural power facilities are taxed to the limit. Hundreds of thousands of farmers on electrified farms will be unable to make full productive use of electricity unless the capacity of the facilities serving them is expanded to keep pace with the growing loads.

For example, a Virginia rural power system planning system improvements reports voltage variations up to 18.8 percent.

The average consumption per consumer on this system has increased 50 percent since 1947. A New Mexico system whose kw demand

has doubled since 1947 is experiencing voltage drops as high as 30 percent and has had to restrict the hours of operation of irrigation pumps on its lines. Countless similar examples could be cited, for the condition is Nation-wide.

Dependable, continuous electric service is more important to farmers than to urban residents. An interruption of service or undue voltage variation may cause farmers irreparable losses.

A cold brooder or a dead water pump motor may mean death of farm animals and poultry. Likewise, the failure of a milking machine may cause a loss in milk production not only during the time of failure but during succeeding days, since the cow must be milked regularly.

Every power supplier serving rural areas must be concerned about these problems of serving unelectrified farms and getting adequate service to those already connected. Farmers cannot accomplish these things individually.

The more than 1,000 REA borrowers are dedicated to a program that will meet these two basic needs. To the extent that loan funds are made available by the Congress, the rural systems are extending lines to unserved farms so they, too, can tool up for efficient production. They are taking steps to heavy up their systems and make sure of adequate power supplies to meet the full power needs of the rural

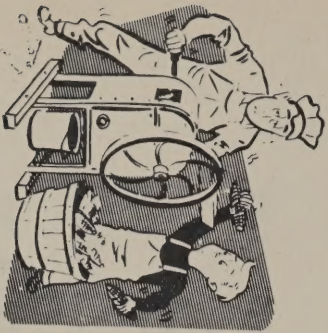
people who are using electricity in ever-increasing quantities and of industries and defense establishments in rural areas.

They are improving their system maintenance. And they are conducting educational programs to help farmers harness electricity to an even greater extent for maximum food and fiber production.

To accomplish these objectives, the rural systems need rather substantial amounts of aluminum and copper and smaller amounts of steel. It is essential that these requirements be given the highest possible priority after military needs are met.

Unless these materials are provided, rural people will
be deprived of services not denied to any other segment
of the economy. And the whole Nation will suffer from
the inability of farmers to meet production goals.

Electricity is strong, fast, cheap, efficient and convenient as a farm production tool and a labor-saver. It is an absolute essential in modern farming. Without the production efficiencies and modern living conditions electric power provides, the Nation cannot hope to maintain the quality and output of its farm labor force.



ELECTRICITY DOES IT 10 TIMES FASTER